# BERLIN MILLS COMPANY *v.* PROCTER & GAMBLE COMPANY.

CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT.

No. 93. Argued November 15, 1920.—Decided December 6, 1920.

Patent No. 1,135,351, issued April 13, 1915, to Procter & Gamble Company, as assignee of John J. Burchenal, is void for lack of invention as to claims 1 and 2, claiming, respectively, a homogeneous lard-like food product consisting of incompletely hydrogenized vegetable oil, and a like product consisting of incompletely hydrogenized cottonseed oil. Pp. 161, 164.

The process of changing vegetable oil into a homogeneous, semi-solid, edible substance, by acting upon it with hydrogen in the presence of nickel, was known and open to general use, and its application to the manufacture of the food products here in question was such a step as would occur to persons skilled in the art, without the exercise of invention. P. 165.

256 Fed. Rep. 23, reversed.

THE case is stated in the opinion.

*Mr. Marcus B. May* and *Mr. Charles E. Hughes*, with whom *Mr. John C. Pennie* and *Mr. Melville Church* were on the briefs, for petitioner.

*Mr. Livingston Gifford*, with whom *Mr. Alfred M. Allen* was on the briefs, for respondent.

*Mr. Charles E. Hughes* and *Mr. Royall Victor*, by leave of court, filed a brief as *amici curiæ*.

MR. JUSTICE DAY delivered the opinion of the court.

This suit was brought by the Procter & Gamble Company against the Berlin Mills Company for the infringe-

ment of the patent of John J. Burchenal for a food product, issued on April 13, 1915, Number 1,135,351, to the Procter & Gamble Company, assignee. The District Court held the patent void for lack of invention, and also that the claims in suit were not infringed. The Circuit Court of Appeals, one judge dissenting, held the patent valid and infringed. 256 Fed. Rep. 23.

The patent in controversy relates to a lard-like food product consisting of a vegetable oil partially hydrogenized to a homogeneous whitish, yellowish product. The record discloses that the making of lard substitutes has been accomplished by mixing melted fat with vegetable oils.

These oils contain glycerides—olein, linolin and stearin. The hydrogenation, or hardening process, has the effect to increase the proportion of the solid glycerides of high saturation. Stearin is called a saturated glyceride for the reason "that there are present in the molecule as many hydrogen atoms as possibly can be joined to the carbon atoms." Linolin and olein are called unsaturated glycerides and can be converted by the addition of hydrogen into hardened glycerides.

The patentee in the specifications of his patent states the object of his alleged invention, and what he intended to accomplish, as follows:

"The special object of the invention is to provide a new food product for a shortening in cooking, in which the liability to become rancid is minimized, and in which the components of such vegetable oils which are inferior and detrimental to use as such a food product have been to a large extent converted into a higher and more wholesome form. All such vegetable oils contain glycerids of unsaturated fatty acids, and among these, notable quantities of fatty glycerids of lower saturation than olein. It is the presence of these glycerids of lower saturation that seriously affects the rancidity of the material. Oxidation is

largely the cause of rancidity, which oxidation weakens the fat at the point of absorption at the double bonds, and these glycerids of lesser saturation readily absorb oxygen from the air at ordinary temperatures, while the more highly saturated glycerids, as olein, only absorb oxygen at elevated temperatures. It is evident, therefore, that oils or fats containing notable quantities of glycerids of linolic acid, or of lesser saturation, are distinctly inferior as an edible product to those containing a minimum of these glycerids with a larger per cent. of olein. On the other hand, while it is important to get rid of the readily oxidizable glycerids of lower saturation, it is also important not to supply too large a per cent. of fully saturated glycerids. . . . Oil, liquid at the ordinary temperatures, does not make the best shortening, because the oil remains liquid, keeping the food in a soggy condition, and the oil will even settle to the under part of the cooked product and soil the cloth, paper, or whatever it may come in contact with. Moreover, fats of a melting point above the temperature of the human body, 98° F., are not so digestible as fats which are liquid at this point, or which have a melting point below 98° F. It is, therefore, my object in the preparation of my new lard-like composition and food-product, and in preparing same from cottonseed oil, to change the chemical composition of the oil to obtain a product with a high percentage of olein, a low percentage of linolin and the lesser-saturated fats, and with only sufficient stearin to make the product congeal at ordinary temperatures.

"In manufacturing this product, cottonseed or other vegetable oil is caused to chemically absorb a limited amount of hydrogen by reacting on the oil with hydrogen in the presence of a catalytic agent and at an elevated temperature. The oil is preferably agitated in a closed vessel in the presence of an atmosphere of compressed hydrogen, a catalyser of finely-divided nickel carried by

kieselguhr being maintained in suspension in the oil and its temperature being raised to about 155° C.

"According to the present invention, the amount of hydrogen absorbed is carefully regulated and limited. In practice, the operation is stopped when the oil has been converted into a product which cools to a white or yellowish semi-solid more closely resembling lard than do the commercial mixtures of cottonseed oil and animal oleostearin, while in many respects the product is superior to the best leaf lard as a shortening. It is not so liable to become rancid and the product can be heated to a considerably higher temperature than lard without smoking or burning. The high temperature to which my product can be raised without smoking or burning makes the product ideal for frying, inasmuch as a crust forms almost instantly on the food fried, which prevents any absorption of the shortening. A lard-like product thus prepared from cottonseed oil has a saponification value of about 195; and an iodin value ranging from about 55 to about 80. The product having an iodin value of 55 has a titer of about 42° and a melting-point of about 40° C.; that having an iodin value of 80 has a titer of about 35° and a melting-point of about 33° C. While but partially hydrogenized, containing from about 1.5% to 2.5% of additional hydrogen more than in the nonhydrogenized material, it shows no free cottonseed oil when subjected to the Halphen test, thereby differing from all commercial lard substitutes containing this oil. It contains from twenty to twenty-five per cent. of fully saturated glycerids, from five to ten per cent. linolin and from sixty-five to seventy-five per cent. olein, and an average of a number of samples gives twenty-three per cent. of saturated fats, seven and five-tenths per cent. linolin and sixty-nine and five-tenths per cent. olein, while the cottonseed oil before treatment contained seventeen per cent. saturated fats, thirty-seven per cent. linolin and forty-six per cent. olein. It will thus be seen

that I have produced an ideal food product, which is high in olein, low in linolin and lesser-saturated fats, and with only enough stearin to make the product congeal at ordinary temperatures."

The patent has seven claims; two broad claims, which are the ones here involved:

1. "A homogeneous lard-like food product consisting of an incompletely hydrogenized vegetable oil."

2. "A homogeneous lard-like food product consisting of incompletely hydrogenized cottonseed oil."

The five additional claims, more specific and limited, are not involved in this suit. Two of the four judges who considered this patent and the validity of the claims in suit reached the conclusion that they were void for want of invention; two judges of the Circuit Court of Appeals held the patent valid, and infringed.

In deciding between these conflicting views we must consider the genesis of the alleged invention, and what was theretofore known and disclosed in the art. Burchenal, the patentee, was not a chemist, and was the General Manager of the Procter & Gamble Company, whose principal business had been the manufacture of soap. One Edwin C. Kayser, who had been in the employ of Crossfield & Son, an English firm, and familiar with the Normann process, to be hereinafter considered, came to this country in 1907, and saw Mr. Burchenal at the Procter & Gamble factory. A contract was made with Kayser, and an experimental plant was erected at the Procter & Gamble works for hydrogenating oil.

It is the contention of the respondent that the merit of Burchenal's alleged invention arises from the fact that he was the first to originate and develop the process involved so as to make a food product of the character described.

The District Court found that Burchenal in fact invented nothing, and that all that was real invention, as established by the testimony, came from Kayser. But

considering, for the purposes of this discussion, that the thought occurred to Burchenal, which he developed in the production of a food product, the subject-matter of this patent, the primary question is presented whether what Burchenal accomplished amounted to invention within the meaning and protection of the patent law.

In considering the patentability of this alleged invention, it is to be remembered that this is not claimed to be a process patent. While the process is described in the specifications, Burchenal makes no claim that it is his invention, indeed, he concedes in the testimony that the process is not his, and counsel frankly say that the patent must stand or fall upon its validity as a product patent of a new and useful thing within the meaning of the patent law. If this product was the result of mechanical improvement only, when viewed in the light of that which was previously disclosed and open to public use, the step in advance being only that which one skilled in the art might well make, without the exercise of the originating or inventing faculty, then the achievement is not within the protection of the patent law.

The English patent to Normann of October, 1903, disclosed to the world the process of converting unsaturated fatty acids, or their glycerides, into saturated compounds. After referring to other discoveries he says:

"By causing acetylene, ethylene, or benzene vapour in mixture with hydrogen gas to pass over one of the said metals, the said investigators obtained from the unsaturated hydrocarbons saturated hydrocarbons, partly with simultaneous condensation.

"I have found, that it is easy to convert by this catalytic method unsaturated fatty acids into saturated acids. This may be effected by causing vapours of fatty acid together with hydrogen to pass over the catalytic metal, which is preferably distributed over a suitable support, such as pumice stone. It is sufficient, however, to expose

the fat or the fatty acid in a liquid condition to the action of hydrogen and the catalytic substance.

"For instance, if fine nickel powder obtained by reduction in a current of hydrogen, is added to chemically pure oleic acid, then the latter heated over an oil bath, and a strong current of hydrogen is caused to pass through it for a sufficient length of time, the oleic acid may be completely converted into stearic acid.

"The quantity of the nickel thus added and the temperature are immaterial and will only affect the duration of the process. Apart from the formation of small quantities of nickel soap, which may be easily decomposed by dilute mineral acids, the reaction passes off without any secondary reaction taking place. The same nickel may be used repeatedly. Instead of pure oleic acid, commercial fatty acids may be treated in the same manner. The yellowish fatty acids of tallow, which melt between 44 and 48° C. and whose iodine number is 35.1, will, after hydrogenation, melt between 56.5 and 59° C., while their iodine number will be 9.8 and their colour slightly lighter than before, and they will be very hard.

"The same method is applicable not only to free fatty acids, but also to their glycerides occurring in nature, that is to say, to fats and oils. Olive oil will yield a hard tallow-like mass; linseed oil and fish oil will give similar results.

"By the new method, all kinds of unsaturated fatty acids and their glycerides may be easily hydrogenized."

An expert witness, called by petitioner, gives in his testimony certain views of this process which commend themselves to our judgment as entirely reasonable and accurate, and so well stated that we quote them in part:

"Dr. Normann discovered, and sets forth in the patent, that unsaturated acids or unsaturated oils by the action of hydrogen in the presence of finely divided nickel may be converted into corresponding saturated compounds. He

defines the reaction rather carefully in some regards. He says, for instance, if fine nickel powder obtained by reduction in a current of hydrogen is added to chemically pure oleic acid, then the latter heated over an oil bath and a strong current of hydrogen is caused to pass through it for a sufficient length of time, the oleic acid may be completely converted into stearic acid.

"Further on he says: 'Apart from the formation of small quantities of nickel soap, which may be easily decomposed by dilute mineral acids, the reaction passes off without any secondary reaction taking place.'

"I think that those two sentences which I have read very well define the product which is obtained by such reduction especially the second sentence, where he says that the reaction goes on in a quantitative way, we will say; that is he says that there is no side reaction takes place. A chemist would know from this first paragraph where he says that oleic acid goes to stearic acid, and from the second one where he says that no side reaction takes place, the chemist would know exactly what the product is which is formed by this reaction. . . .

"I would call attention particularly to the fact that he hardened olive oil to a hard, tallow-like mass. Tallow is a substance that is obtained from the fat of either cattle or of sheep and is a substance of somewhat semi-solid character; that is, its lower limit of melting point is within a lard range and its upper limit is just slightly beyond the lard range so that if Normann hardened olive oil to a tallow-like mass that means that he hardened it to a product of a semi-solid character. . . .

"Q. 63. Does Normann specify anywhere in his patent any of the purposes for which his patents are intended?

"A. He does not. He says nothing in the patent as to what these products should be used for. The presumption is that they might be used for any purpose for which fats of that general character could be utilized. They might be

used for making candles; they might be used for soaps; they might be used for edible purposes.

"By the passages I have read he has very carefully specified what the product is so that any chemist would know for what particular purposes it might be useful.

"Q. 64. In the process of hydrogenation as described in the Normann patent from which you made citations; that is, the British patent No. 1515 of 1903, what would your conclusion be as to the edibility of the resultant product when the material hydrogenated was among those suggested by him, olive oil?

"A. If an edible olive oil was started with one would certainly obtain an edible hydrogenated product."

It is in evidence that this method, shown by Normann, is a practicable one, and may be used for the making of edible food products of the kind here involved.

With the knowledge disclosed in the Normann patent conclusively presumed to be known by the patentee, was it invention to apply the known process to vegetable oils? In this connection the history of the application for the patent in suit in the Patent Office is interesting and instructive. It is true that claims one and two were finally allowed, and the patentee is entitled to the presumption which arises from the granting of them. But it appears in the history of the application for the Burchenal patent, found in the record, that as originally presented it contained two claims not so broad as the ones now in suit, and a third claim for "A semi-solid hydrogenized oil," was added by amendment. All of the claims were rejected, the examiner saying:

"The composition of lard and of cottonseed oil as to the glycerides olein and stearin that they contain is well known. To make a product from cottonseed oil that shall simulate lard the content of stearin should be increased. [Referring to patents.] It is thought therefore that if the problem of simulating lard from cottonseed oil were

presented to an oil chemist, an incomplete hydrogenization of the cottonseed oil would at once suggest itself to him as a solution of the problem. All the claims are accordingly rejected on the above ground of lack of invention. Claim 3 is further rejected on the product formed by the above cited patents."

Replying to the communication of the examiner amendment was made canceling claim 3. Further consideration was requested on claims 1 and 2, upon arguments which were presented. The claims were afterwards rejected upon reference to patents to Kayser of September 26, 1911, and November 14, 1911, the examiner stating that these patents were adapted to hydrogenize glycerides, the latter one specifically mentioning its adaptability for cottonseed oil, and that the process could be arrested at any time during its progress and thus an incompletely hydrogenized article be produced.

Subsequently the specifications were amended, giving more definitely the percentages of olein, linolin and stearin. The patentee concludes the amended specifications, stating "It will thus be seen that we have produced an ideal food product, which is high in olein, low in linolin and lesser-saturated fats, and with only enough stearin to make the product congeal at ordinary temperatures;" additional and more limited claims were added, but ultimately the patent, containing the broad claims here involved, was granted.

It is true, as the Circuit Court of Appeals states in its opinion, that the applicant never did acquiesce in the examiner's action rejecting his claims, and finally obtained what he had in the first place asked for.

This record establishes that it was known before Burchenal took up the subject that a vegetable oil could be changed into a semi-solid, homogeneous, substance by a process of hydrogenation arrested before completion and that it might be edible. This much of the art was public

property and open to general use. The product of this process was known and open to public use. To supply such products as the patentee has described in the broad claims in suit may have been new and useful, but does not in our opinion arise to the dignity of invention, and is an advance step which would occur to one skilled in the art when investigating and considering the subject. It follows that the decree of the Circuit Court of Appeals must be reversed and the cause remanded to the District Court with directions to dismiss the bill on the ground that claims 1 and 2 are void for the reasons stated in this opinion.

*Reversed.*